What Is Claimed Is:

1. A fire detector (1) according to the scattered radiation principle comprising at least one radiation transmitter and one radiation receiver, whose beam paths form a scattering volume,
wherein the fire detector (1) comprises at least one first radiation transmitter (5.1) and one first radiation receiver (6.1) and one second radiation transmitter (5.2) and radiation receiver (6.2), whose beam paths form at least two spatially separated scattering volumes (7.1, 7.2).

2. The fire detector (1) as recited in Claim 1,
wherein it can be installed flush with the ceiling.

3. The fire detector as recited in one of the preceding claims,
wherein it is covered by a cover plate (4).

4. The fire detector as recited in one of the preceding claims,
wherein it does not include an optical labyrinth.

5. The fire detector (1) as recited in one of the preceding claims,
wherein the scattering volumes (7.1, 7.2) are at different distances from the cover plate (4).

6. The fire detector as recited in one of the preceding claims,
wherein the fire detector (1) comprises at least one third radiation transmitter (5.3) and at least one third radiation receiver (6.3), whose beam paths form a third scattering volume (7.3), the third scattering volume (7.3) including at

least a partial area of the surface (4.1) of the cover plate (4) covering the fire detector (1).

7. The fire detector as recited in one of the preceding claims,
wherein the beam paths of the radiation transmitters (5.1) and (5.2) are oriented rotated by an angle (for example, by an angle of 180°) from one another.

8. The fire detector as recited in one of the preceding claims,
wherein the beam paths of the radiation transmitters (5.1, 5.2) and the radiation receivers (6.1, 6.2) form two additional scattering volumes (7.4 and 7.5).

9. The fire detector as recited in one of the preceding claims,
wherein the scattering volumes (7.1, 7.2, 7.3, 7.4) are situated at different distances from the surface (4.1) of the cover plate (4).

10. The fire detector as recited in one of the preceding claims,
wherein the scattering volumes (7.4, 7.5) have a larger distance from the cover plate (4) of the fire detector (1) than the scattering volumes (7.1, 7.2), in such a way that a smaller scattering angle results for a scattering action on these scattering volumes (7.4, 7.5).

11. The fire detector as recited in one of the preceding claims,
wherein the fire detector (1) includes holders (70) for accommodating radiation transmitters (5.1, 5.2, 5.3) and radiation receivers (6.1, 6.2, 6.3).

12. The fire detector as recited in one of the preceding claims,
wherein the holders (70), for the purpose of mounting the radiation transmitters (5.1, 5.2, 5.3) and radiation receivers (6.1, 6.2, 6.3) at a predefinable angle in relation to an external surface of the holder (70), have angularly situated recesses (71).

13. The fire detector as recited in one of the preceding claims,
wherein windows (72) are situated in the holders (70), which allow the passage of radiation.

14. The fire detector as recited in one of the preceding claims,
wherein the holder (70) is made of a material that absorbs the radiation emitted by the radiation transmitter.

15. A method for operating a fire detector as recited in one of the preceding claims,
wherein scattered radiation measured values (S11, S22) are obtained from two different scattering volumes (7.1, 7.2), these scattered radiation measured values (S11, S22) are compared to one another; if the scattered radiation measured values (S11, S22) are essentially equal, the presence of smoke and therefore a source of fire is inferred and, if the scattered radiation measured values (S11, S22, with S11 and S22> 0) deviate from one another, the presence of an interfering body in a scattering volume (7.1, 7.2) is inferred.

16. The method as recited in one of the preceding claims,
wherein scattered radiation measured values (S11, S22) are

obtained essentially simultaneously from at least two simultaneously activated scattering volumes (7.1, 7.2).

17. The method as recited in one of the preceding claims, wherein scattered radiation measured values (S11, S22) are obtained sequentially in time from alternately activated scattering volumes (7.1, 7.2).

18. The method as recited in one of the preceding claims, wherein at least one scattering volume (7.3), which includes at least partial areas of the surface (4.1) of a cover plate (4) which covers the fire detector (1), is formed by the beam paths of at least one radiation transmitter (5.3) and at least one radiation receiver (6.3), a first scattered radiation measured value (S33) is obtained by activating the radiation transmitter (5.3) and radiation receiver (6.3) at a first instant (T1) when the surface (4.1) of the cover plate (4) is clean, and this scattered radiation measured value is predefined as an idle signal characterizing a clean cover plate (4).

19. The method as recited in one of the preceding claims, wherein a scattered radiation measured value (S33x) obtained at a later instant (Tx) is compared to the scattered radiation measured value (S33) obtained at the first instant (T1), and soiling of the cover plate (4) is inferred if S33x > S33.

20. The method as recited in one of the preceding claims, wherein a limiting value (G) is predefinable for the scattered radiation measured value (S33x), and maintenance of the fire detector (1) is requested if this limiting value (G) is exceeded.

21. The method as recited in one of the preceding claims, wherein, if the scattered radiation measured value (S33x) obtained at a later instant (Tx) falls below the scattered radiation measured value (S33) obtained at a first instant (T1), a change of the ambient temperature and/or aging of the radiation transmitter (5.3) is inferred.

22. The method as recited in one of the preceding claims, wherein, when determining a change of the ambient temperature and/or aging of the radiation transmitter (5.3) through comparison, a correction factor (KF) is derived, in particular also through quotient calculation of the scattered radiation measured values (S33) and (S33x).

23. The method as recited in one of the preceding claims, wherein a current corrected by the correction factor (KF) is applied to the radiation transmitter (5.3).

24. The method as recited in one of the preceding claims, wherein scattered radiation measured values (S11, S22, S33, S33x, S12, S21) are obtained from scattering volumes (7.1, 7.2, 7.3, 7.4, 7.5), which are at different distances from the cover plate (4) of the fire detector (1).

25. The method as recited in one of the preceding claims, wherein the type of smoke is determined and objects are recognized through comparison of the scattered radiation measured values (S11, S22, S33, S33x, S12, S21), in particular by calculating the quotients between the scattered radiation measured values (S11, S22, S33, S33x, S12, S21).

26. The method as recited in one of the preceding claims, wherein, for the purpose of the function check of radiation transmitters (5.1, 5.2, 5.3) and radiation receivers (6.1,

6.2, 6.3) of the fire detector (1), radiation transmitters (5.1, 5.2, 5.3) and radiation receivers (6.1, 6.2, 6.3) of the fire detector (1) are controlled selectively, and radiation emitted from a selectively controlled radiation transmitter (5.1, 5.2, 5.3) is conducted to a selectively controlled radiation receiver (6.1, 6.2, 6.3) within the fire detector (1).